

Adopted 10-6-10

SC K-12.1 Comprehensive Science Standard – Inquiry, the Nature of Science, and Technology

Students will combine scientific processes and knowledge with scientific reasoning and critical thinking to ask questions about phenomena and propose explanations based on gathered evidence.

1. Inquiry, the Nature of Science, and Technology	Grade Band Standards			
	K-2	3-5	6-8	9-12
1. Abilities to do Scientific Inquiry	SC2.1.1 Students will ask questions and conduct investigations that lead to observations and communication of findings.	SC5.1.1 Students will plan and conduct investigations that lead to the development of explanations.	SC8.1.1 Students will design and conduct investigations that will lead to descriptions of relationships between evidence and explanations.	SC12.1.1 Students will design and conduct investigations that lead to the use of logic and evidence in the formulation of scientific explanations and models.
Scientific Questioning	SC2.1.1.a Ask questions that relate to a science topic	SC5.1.1.a Ask testable scientific questions	SC8.1.1.a Formulate testable questions that lead to predictions and scientific investigations	SC12.1.1.a Formulate a testable hypothesis supported by prior knowledge to guide an investigation
Scientific Investigations	SC2.1.1.b Conduct simple investigations	SC5.1.1.b Plan and conduct investigations and identify factors that have the potential to impact an investigation	SC8.1.1.b Design and conduct logical and sequential investigations including repeated trials	SC12.1.1.b Design and conduct logical and sequential scientific investigations with repeated trials and apply findings to new investigations
Scientific Controls and Variables			SC8.1.1.c Determine controls and use dependent (responding) and independent (manipulated) variables	SC12.1.1.c Identify and manage variables and constraints
Scientific Tools	SC2.1.1.c Select and use simple tools appropriately	SC5.1.1.c Select and use equipment correctly and accurately	SC8.1.1.d Select and use equipment appropriate to the investigation, demonstrate correct techniques, and apply appropriate mathematical concepts	SC12.1.1.d Select and use lab equipment and technology appropriately and accurately
Scientific Observations	SC2.1.1.d Describe objects, organisms, or events using pictures, words, and numbers	SC5.1.1.d Make relevant observations and measurements	SC8.1.1.e Make qualitative and quantitative observations	SC12.1.1.e Use tools and technology to make detailed qualitative and quantitative observations
Scientific Data Collection	SC2.1.1.e Collect and record observations	SC5.1.1.e Collect and organize data	SC8.1.1.f Record and represent data appropriately and review for quality, accuracy, and relevancy	SC12.1.1.f Represent and review collected data in a systematic, accurate, and objective manner

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1. Inquiry, the Nature of Science, and Technology	Grade Band Standards			
	K-2	3-5	6-8	9-12
Scientific Interpretations, Reflections, and Applications		SC5.1.1.f Develop a reasonable explanation based on collected data	SC8.1.1.g Evaluate predictions, draw logical inferences based on observed patterns/relationships, and account for non-relevant information	SC12.1.1.g Analyze and interpret data, synthesize ideas, formulate and evaluate models, and clarify concepts and explanations SC12.1.1.h Use results to verify or refute a hypothesis SC12.1.1.i Propose and/or evaluate possible revisions and alternate explanations
Scientific Communication	SC2.1.1.f Use drawings and words to describe and share observations with others	SC5.1.1.g Share information, procedures, and results with peers and/or adults SC5.1.1.h Provide feedback on scientific investigations	SC8.1.1.h Share information, procedures, results, and conclusions with appropriate audiences SC8.1.1.i Analyze and provide appropriate critique of scientific investigations	SC12.1.1.j Share information, procedures, results, conclusions, and defend findings to a scientific community (peers, science fair audience, policy makers) SC12.1.1.k Evaluate scientific investigations and offer revisions and new ideas as appropriate
Mathematics	SC2.1.1.g Use appropriate mathematics in all aspects of scientific inquiry	SC5.1.1.i Use appropriate mathematics in all aspects of scientific inquiry	SC8.1.1.j Use appropriate mathematics in all aspects of scientific inquiry	SC12.1.1.l Use appropriate mathematics in all aspects of scientific inquiry

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2. Nature of Science		SC5.1.2 Students will describe how scientists go about their work.	SC8.1.2 Students will apply the nature of science to their own investigations.	SC12.1.2 Students will apply the nature of scientific knowledge to their own investigations and in the evaluation of scientific explanations.
Scientific Knowledge		SC5.1.2.a Recognize that scientific explanations are based on evidence and scientific knowledge	SC8.1.2.a Recognize science is an ongoing process and the scientific community accepts and uses explanations until they encounter new experimental evidence not matching existing explanations	SC12.1.2.a Recognize that scientific explanations must be open to questions, possible modifications, and must be based upon historical and current scientific knowledge
Science and Society		SC5.1.2.b Recognize that new discoveries are always being made which impact scientific knowledge	SC8.1.2.b Describe how scientific discoveries influence and change society	SC12.1.2.b Describe how society influences the work of scientists and how science, technology, and current scientific discoveries influence and change society
Science as a Human Endeavor		SC5.1.2.c Recognize many different people study science	SC8.1.2.c Recognize scientists from various cultures have made many contributions to explain the natural world	SC12.1.2.c Recognize that the work of science results in incremental advances, almost always building on prior knowledge, in our understanding of the world SC12.1.2.d Research and describe the difficulties experienced by scientific innovators who had to overcome commonly held beliefs of their times to reach conclusions that we now take for granted

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1. Inquiry, the Nature of Science, and Technology	Grade Band Standards			
	K-2	3-5	6-8	9-12
3. Technology		SC5.1.3 Students will solve a simple design problem.	SC8.1.3 Students will solve a design problem which involves one or two science concepts.	SC12.1.3 Students will solve a complex design problem.
Abilities to do Technical Design		<p>SC5.1.3.a Identify a simple problem</p> <p>SC5.1.3.b Propose a solution to a simple problem</p> <p>SC5.1.3.c Implement the proposed solution</p> <p>SC5.1.3.d Evaluate the implementation</p> <p>SC5.1.3.e Communicate the problem, design, and solution</p>	<p>SC8.1.3.a Identify problems for technical design</p> <p>SC8.1.3.b Design a solution or product</p> <p>SC8.1.3.c Implement the proposed design</p> <p>SC8.1.3.d Evaluate completed technological designs or products</p> <p>SC8.1.3.e Communicate the process of technical design</p> <p>SC8.1.3.f Distinguish between scientific inquiry (asking questions about the natural world) and technological design (using science to solve practical problems)</p> <p>SC8.1.3.g Describe how science and technology are reciprocal</p> <p>SC8.1.3.h Recognize that solutions have intended and unintended consequences</p> <p>SC8.1.3.i Compare and contrast the reporting of scientific knowledge and the reporting of technological knowledge</p>	<p>SC12.1.3.a Propose designs and choose between alternative solutions of a problem</p> <p>SC12.1.3.b Assess the limits of a technological design</p> <p>SC12.1.3.c Implement the selected solution</p> <p>SC12.1.3.d Evaluate the solution and its consequences</p> <p>SC12.1.3.e Communicate the problem, process, and solution</p> <p>SC12.1.3.f Compare and contrast the reasons for the pursuit of science and the pursuit of technology</p> <p>SC12.1.3.g Explain how science advances with the introduction of new technology</p> <p>SC12.1.3.h Recognize creativity, imagination, and a good knowledge base are all needed to advance the work of science and engineering</p>
Understanding of Technical Design				